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## Stability vs. Optimality of Cooperative Multiagent Control



a lecture by

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středa, 18. prosince v 10:00

KN:E-14 (Karlovo náměstí, Fakulta elektrotechnická)

Distributed systems of agents linked by communication networks only have access to information from their neighboring agents, yet must achieve global agreement on team activities to be performed cooperatively. Examples include networked manufacturing systems, wireless sensor networks, networked feedback control systems, and the internet. Sociobiological groups such as flocks, swarms, and herds have built-in mechanisms for cooperative control wherein each individual is influenced only by its nearest neighbors, yet the group achieves consensus behaviors such as heading alignment, leader following, exploration of the environment, and evasion of predators. It was shown by Charles Darwin that local interactions between population groups over long time scales lead to global results such as the evolution of species.

Natural decision systems incorporate notions of optimality, since the resources available to organisms and species are limited. This talk investigates relations between the stability of cooperative control and optimality of cooperative control.